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Appl. No.	:	10/573,738	Confirmation No.	2271
Applicant	:	Richard M. Miller-Smith		
Filed	:	March 28, 2006		
TC/A.U.	:	2611		
Examiner	:	Kevin Michael Burd		
Docket No.	:	348162-982780		
Customer No.	:	26379		

Title: METHOD AND APPARATUS FOR IMPROVED INVERSE TRANSFORM
          CALCULATION

                    RESPONSE TO FINAL OFFICE ACTION

MS/Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Sir:

        In response to the office action mailed on November 16, 2010, please amend the above-
identified application as follows:

        Amendments to the Claims are reflected in the listing of claims which begins on page 2 of
this paper.

        Amendments to the Specification appears on page 5.

        Remarks/Arguments begin on page 6 of this paper.

1.   Listing of the claims:

1.   (Currently Amended) A method of determining, from transform coded data, an inverse transform to generate a number of bits required to represent an output value which would be obtained as a result of an inverse transform being performed on said transform coded data, said method comprising the steps of:

obtaining, at an MPEG decoder, a sum of coefficient values within said transform coded data;

comparing, in the MPEG decoder, this sum to a pre-determined threshold value;

deciding, in the MPEG decoder, as a consequence of said comparison which inverse transform implementation, ~~out of a number of pre-determined~~ selected from an 8 bit inverse transform implementation ~~implementations~~ and a 9 bit inverse transform implementation, should be performed when decoding said transform coded data; and

performing in the MPEG decoder on the transform coded data, the decided inverse transform.

2.   (Original) A method as claimed in claim 1 wherein said transform coded data is discrete cosine transform (DCT) coded data

3.   (Previously Presented)   A method as claimed in claim 1 wherein said transform coded data is MPEG-1 or MPEG-2 encoded video data.

4.   (Previously Presented) A method as claimed in claim 1 wherein said method is used to determine whether said output values can be represented in eight bits, or require nine bit representation.

5.   Cancelled.

6.   (Original) A method as claimed in claim 5 wherein at least one of said inverse transform implementations includes instructions for handling of multiple eight bit values in longer words.

7.   (Previously Presented) A method as claimed in claim 1 wherein the coefficient values are bi-polar, and said sum is of the absolute values of the coefficients.

8.   (Previously Presented) A method as claimed in claim 1 wherein the transform coded data consists of an 8x8 discrete cosine transform.

9.   (Original) A method as claimed in claim 8 wherein said pre-determined threshold value is in the range 500 to 530.

10.   (Currently Amended) Apparatus for determining, from transform coded data, an inverse transform to generate a number of bits required to represent an output value which would be obtained as a result of an inverse transform being performed on said transform coded data, said apparatus comprising

means for obtaining a sum of coefficient values within said transform coded data

means for comparing this sum to a predetermined threshold value;

means for deciding as a consequence of said comparison which inverse transform implementation, ~~out of a number of pre-determined implementations~~ selected from an 8 bit inverse transform implementation and a 9 bit inverse transform implementation, should be performed when decoding said transform coded data; and

means for performing on the transform coded data, the decided inverse transform.

11.   (Original) Apparatus as claimed in claim 10 wherein said transform coded data is discrete cosine transform (DCT) coded data.

12.   (Previously Presented) Apparatus as claimed in claim 10 wherein said transform coded data is MPEG-1 or MPEG-2 encoded video data.

13.   (Previously Presented) Apparatus as claimed in claim 10 wherein said apparatus is suitable for to determining whether said output values can be represented in eight bits, or require nine bit representation.

14.   Cancelled.

15.   (Original) Apparatus as claimed in claim 14 wherein at least one of said inverse transform implementations includes instructions for handling of multiple eight bit values in longer words.

16. (Previously Presented) Apparatus as claimed in claim 10 wherein the coefficient values are bi-polar, and said sum is of the absolute values of the coefficients.

17. (Previously Presented) Apparatus as claimed in claim 10 wherein the transform coded data consists of an 8x8 discrete cosine transform.

18. (Original) Apparatus as claimed in claim 17 wherein said predetermined threshold value is in the range 500 to 530.

19. (Currently Amended) A non-transitory record carrier ~~wherein are~~ that stores recorded program instructions for causing a programmable processor to perform the steps of the method as claimed in claim 1.

2.   Amendment to the Specification:

On page 1, after the title, please insert the following paragraph:

This patent application claims the benefit of and priority under 35 USC 119(a)-(d) to PCT Patent Application Serial No. PCT/IB2004/051918, filed on September 29, 2004 and entitled "Method and Apparatus for Improved Inverse Transform Calculation" which in turn claims the benefit of and priority under 35 USC 119(a)-(d) to United Kingdom Patent Application Serial No. 0323038.0, filed on October 2, 2003, the entirety of both of which are incorporated herein by reference.

<div align="center">REMARKS</div>

In response to the rejection of claim 19 under 35 USC 101, Applicant has amended the claim pursuant to the memo for "Subject Matter Eligibility of Computer Readable Media" (*See 1351 OG 212*) that was cited in the Final Office action so that the claim is directed to statutory subject matter and the rejection should be withdrawn. Furthermore, no new matter has been added pursuant to the memo for "Subject Matter Eligibility of Computer Readable Media."

Applicant requests that the examiner consider the prior art cited in an Information Disclosure Statement that is being filed with this response and the RCE.

<div align="center">PRIOR ART REJECTIONS</div>

In response to the rejection of claims 1-4, 6-13 and 15-19 under 35 USC 103 as being unpatentable over US Patent Application Publication No. 2002/0164081 to Zhou ("Zhou Patent") in view of the "IDCT Output Range…" Article by Zhou et al. (the "Zhou Article"), Application traverses the rejection because the combination of the Zhou Patent and the Zhou Article does not disclose or suggest each claim element.

Claims 1 and 10

Claims 1 and 10 recite claim elements that are not disclosed by the combination of the Zhou Patent and the Zhou Article for the reasons set forth below.

Deciding the Inverse Transform Implementation Claim Element

Claim 1 recites "deciding, in the MPEG decoder, as a consequence of said comparison which inverse transform implementation, selected from an 8 bit inverse transform implementation and a 9 bit inverse transform implementation, should be performed when decoding said transform coded data" and claim 10 recites "means for deciding as a consequence of said comparison which inverse transform implementation, selected from an 8 bit inverse transform implementation and a 9 bit inverse transform implementation, should be performed when decoding said transform coded data", which are not disclosed or suggested by the combination of the Zhou Patent and the Zhou Article.

The Zhou Article discloses that, for compression, the DCT transform input should have a precision of 8 bit in 'intra'-coding and 9 bit in motion compensated predictive coding. *See Zhou Article at 137, left column.* The Zhou Article discloses that IDCT occurs, but that it is clipped to a

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range of -255 to 255 which means that it discloses that a single implementation for the IDCT is used. *See Zhou Article at 137, right column*. The Zhou Article also discloses that the intra-block range of 0 to 255 while the inter-block range is -255 to 255. *See Zhou Article at 141, left column*. The Zhou Article does not disclose or suggest deciding an inverse transform implementation selected from one of an eight bit inverse transform implementation and a nine bit inverse transform implementation that should be performed when decoding said transform coded data as recited in claims 1 and 10. Thus, the Zhou Article does not disclose or suggest this claim element.

The Zhou Patent (which the examiner relies on for disclosing these claim elements) discloses an image compression method in which an inverse discrete cosine transform (IDCT) is performed during video encoding to provide motion estimation/motion compensation. *See Zhou Patent at Figures 3 and 4 and paragraph 0004*. The Zhou Patent also discloses, for intra frame compression, that the sum of Absolute AC coefficients (SM) for each 8X8 block in a macroblock is computed. *See Zhou Patent at 0015*. The Zhou Patent uses the SM value to whether or not AC coefficients are quantized and coded by the VLC. *See Zhou Patent at 0015*. Furthermore, a single implementation of an inverse transform is used. *See Zhou Patent at 0004*. Thus, in the Zhou Patent, the method used chooses, based on the sum of the AC coefficients, whether or not to quantize/inverse quantize the AC coefficients. Therefore, the Zhou Patent does not disclose or suggest deciding an inverse transform implementation selected from one of an eight bit inverse transform implementation and a nine bit inverse transform implementation that should be performed when decoding said transform coded data as recited in claims 1 and 10.

Thus, the combination of the Zhou Patent and the Zhou Article do not disclose or suggest this claim element.

Performing the Inverse Transform Claim Element

Claim 1 also recites "performing in the MPEG decoder on the transform coded data, the decided inverse transform" and claim 10 also recites "means for performing on the transform coded data, the decided inverse transform" which are not disclosed or suggested by the combination of the Zhou Patent and the Zhou Article.

The Zhou Article does not disclose this claim feature since any inverse transform uses only one implementation as set forth above. *See Zhou Article at 137, right column*. Thus, the Zhou

Article does not disclose or suggest this claim element in which a decided inverse transform (selected for an 8 bit implementation and a 9 bit implementation) is used.

The Zhou Patent does not disclose this claim feature since any inverse transform uses only one implementation as set forth above. *See Zhou Patent at paragraph 0004.* Thus, the Zhou Patent does not disclose or suggest this claim element in which a decided inverse transform (selected for an 8 bit implementation and a 9 bit implementation) is used.

Thus, this claim element is not disclosed or suggest by the combination of the Zhou Patent and the Zhou Article.

Summary

Several claim elements are not disclosed or suggested by the combination of the Zhou Patent and the Zhou Article and the obviousness rejection should be withdrawn.

Claims 2-4, 6-9 and 11-13 and 15-19

These claims depend from independent claims 1 and 10 and these claims are not obvious over the combination the Zhou Patent and the Zhou Article for at least the same reasons as the independent claims.

<u>CONCLUSION</u>

In view of the above, it is respectfully submitted that Claims 1-4, 6-14 and 15-19 are allowable over the prior art cited by the Examiner and early allowance of these claims and the application is respectfully requested.

The Examiner is invited to call Applicant's attorney at the number below in order to speed the prosecution of this application.

The Commissioner is authorized to charge any deficiencies in fees and credit any overpayment of fees to Deposit Account <u>No. 07-1896</u>.

Respectfully submitted,

DLA PIPER LLP US

Dated: __April 18, 2011_____   By _/Timothy W. Lohse/___
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